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latitude. The longer ones are most numerous near the middle of each zone, and slightly more inclined to the normal than the shorter ones, in order that the more distant portions of the needles (representing the outgoing streams) shall have directions roughly the same as required by physical laws. Eight photographs of the model, representing the various types of the corona, were also shown. When the model is placed in a beam of parallel rays and its shadow allowed to fall upon a screen, the slightest change in the position of the model produces an entirely new image. Mr. SCHAEBERLE stated that he had thus far been unable to find a single observed phenomenon which could not be accounted for by this mechanical theory.

A discussion of the theory and a comparison, showing the remarkable agreement with observation, will appear in the Report of the Eclipse of December 21, 1889.

PHOTOMETRY OF THE CORONA OF DECEMBER, 1889.

By EDWARD S. HOLDEN.

[ABSTRACT.]

Mr. HOLDEN gave an account of the photometric determinations of the actinic brightness of the corona. Two of the plates taken by Mr. BURNHAM and two taken by Mr. SCHAEBERLE were standardized. A preliminary reduction of these plates shows that the brightness of the corona and sky, as measured directly from the plates, will substantially reproduce the results obtained by Mr. W. H. PICKERING at the eclipse of 1886, in Grenada. That is, the brightness of the corona, as measured directly from the plates, will be only about 40 *per cent.* of that obtained from Mr. BARNARD'S plates of the California eclipse of January 1, 1889. Mr. PICKERING'S plates of 1886 were not developed for several months after the eclipse, and when developed the films were found to have deteriorated. The Cayenne plates showed considerable deterioration, due to dampness, though they were developed immediately after exposure. Precautions were, however, taken, before the eclipse, which will possibly enable us to give a numerical estimate of the amount of change. Besides the eclipse plates ten others (A, B, C, D, E, F, G, H, I, J), were standardized by Mr. BARNARD at the Lick Observatory, on September 24, 1889. A, B, C, D were taken to the eclipse, and E, F, G, H, I, J remained at the Lick Observatory. I and J were developed on September 24, 1889, immediately after exposure. A and B were developed at Cayenne on December 22, 1889. E and F were developed at the Lick Observatory on the same day. C and D were returned undeveloped to the Lick Observatory (arriving there March 5, 1890). G and H (still undeveloped) and C and D were then re-standardized by Mr. BARNARD (March 16th), and all four were developed together March 17th. Thus, a complete history of the changes of these plates is available; and it is possible that a numerical factor can be obtained by which to multiply the measures of brightness obtained directly from the plates taken at Cayenne, to obtain the results which they would have given, had the eclipse occurred at Mt. Hamilton.

The practical result of this interesting experiment is to show that plates which are to be exposed in a damp climate should be hermetically sealed until they are exposed, and again sealed immediately afterwards. The agreement between the results of Mr. PICKERING'S measures and those of December, 1889, shows that both are erroneous. The measures on the plates of January, 1889, are to be taken as correct, for the present, at least.

NOTICES FROM THE LICK OBSERVATORY.

PREPARED BY MEMBERS OF THE STAFF.

INTERNATIONAL CONGRESS OF CELESTIAL PHOTOGRAPHY.

The International Astro-Photographic Congress, which met at Paris in 1888, is now divided into two parts. The first is concerned with the production of the stellar charts of the whole sky; the work of the second relates to the application of photography to the study of the physical conditions of the sun and stars. The first section publishes a *Bulletin* of which four parts (in quarto) have already appeared. The second section has just printed the *Procès-verbaux* of its meetings in September, 1889, and a summary of this important document follows.

Thirty-nine of the sixty-six members of the Congress were present at the sessions, and joined in discussions of the varied questions brought before the meeting. The President, M. JANSSEN, in his opening address, briefly reviewed the field of work, which was then considered in detail. The conclusions of the Congress are here summarized: